

TITLE: DEVELOPMENT OF A NOVEL CATALYST FOR NO DECOMPOSITION

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INDUSTRY

COLLABORATOR: Airflow Catalyst Systems

GRANT NUMBER: DE-FG26-03NT41911

PERIOD OF

PERFORMANCE: September 15, 2003– March 31, 2004

DATE: April 1, 2004

ABSTRACT

OBJECTIVE

The main objective of the proposed research is the evaluation of the Pt/SnO₂ catalysts for the decomposition of NO in simulated power plant stack gases with particular attention to the resistance to deactivation by O₂, CO₂, and elevated temperatures.

ACCOMPLISHMENTS TO DATE

In this period of performance

- Two batches of Pt/SnO₂ catalyst, one containing 15 % Pt and the other 10 % Pt were prepared and delivered to us.
- GC-MS calibration runs for O₂, NO, and N₂O were completed for two different sample sizes.
- The temperature Programmed Desorption (TPD) runs for 15 % Pt/SnO₂ catalyst treated with 1-ml doses of 1.93 % NO in He were completed.
- The temperature Programmed Desorption (TPD) runs for 15 % Pt/SnO₂ catalyst treated with 1-ml doses of 1.93 % NO and subsequently with 1-ml doses of 3.6 % O₂ in He were completed.
- Construction of a gas feed system for the Temperature Programmed Reaction (TPReac) studies was started.

Data has been collected, but data will be analyzed after the completion of the GC-MS calibration.

PLANS FOR THE COMING YEAR

- Complete the TPD and TPReac runs for the 15 % Pt/SnO₂, 10 % Pt/SnO₂, and 5 % Pt/SnO₂ catalysts.
- Complete the calibration of GC-MS.
- Complete the evaluation of the data and select the catalyst composition for testing in the laboratory size packed bed reactor.
- Start the equilibrium calculations of NO decomposition.

- Start the evaluation of the selected catalyst under simulated stack gas conditions.

ARTICLES, PRESENTATIONS, AND STUDENT SUPPORT

Journal Articles (peer reviewed)

None

Conference Presentations

To be presented at the HBCU/OMI Meeting, Pittsburgh, PA, June 9-10, 2004.

Students Supported Under This Grant

The following undergraduate chemical engineering students were supported under this grant:

- Shaia Anderson
- Shanitra Sanders
- Jillyan Harlan
- Michael Rupert